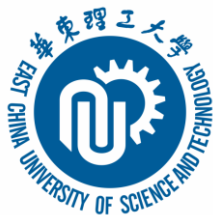


# ABET认证过程和体会



郭旭虹

华东理工大学化工学院

2014年10月11日

## 汇报内容

1. ABET认证过程回顾
2. 认证准备的体会
3. 实验室安全改造的体会
4. 致谢



## 为什么要进行ABET认证

美国工程与技术认证委员会  
(Accreditation Board for Engineering and Technology  
简称ABET)

成立于1932,总部在Baltimore, Maryland

- 国际化趋势
- 学生出国、转学、学分认可
- 毕业生资质认可
- 学科评估优势
- 中国加入“华盛顿协议”：  
工程教育日益全球化、标准化。

## 认证的选择

### 英国化学工程师协会

- ◆ 针对化工专业
- ◆ 历史40余年
- ◆ 认证达25个国家和地区
- ◆ 天津大学已经过认证

### 美国工程与技术认证委员会

- 面对所有工程类教育
- 历史超过80年
- 认证已有24个国家和地区
- 工程准则EC2000的提出者
- 依托美国先进完善的教育体系
- 中国尚无高校或专业通过认证



领导决策：选择ABET，为中国探索另一条新路

# 领导决策

(2012年初)



选择ABET而不是IChemE，为中国探索一条新路

## Connection with US University: Faculty



Prof. Robert K. Prud'homme  
from Princeton University



At Lehigh University



Prof. Paul L. Dubin  
from U-Mass Amherst



At Carnegie Mellon University

## Connection with US University: Students

### Undergraduate exchange programs:

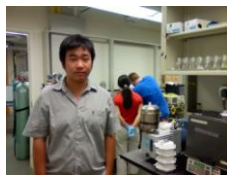
- University of Missouri-Columbia, “2+2 and 3+1+1 Project” (10)
- University of Houston “3+1+1 Project” (10)
- Lamar University “3+1+1 Project” (5)
- New Mexico State University “3+1+1 Project” (8)
- Wayne State University “3+1+1 Project” (6)



Rajiv Jaini  
From Lamar University



Camille Meza  
From University of Houston



Zhi Xu  
at University of Cincinnati



Anthony L. Smith  
(美国南加州大学)

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## First AIChE Student Chapter in China



## 认证过程大事记

2012年5月5日：访问ABET总部；

2013年2月15日：正式提交认证申请；

**3月19-22日：ABET顾问Briedis教授来我校考察；**

4月8日：通过ABET预认证；

6月27日：ABET确定现场认证专家组和认证日期；

9月13日：化工学院教师动员大会；

9月23-25日：化工学院在徐汇和奉贤校区召开学生动员大会；

**10月8-9日：AIChE主席Westmoreland教授考察；**

**10月9-10日：俄亥俄州立大学Rathman教授模拟认证；**

11月7-8日：陈英南副校长带领相关部处领导检查准备情况；

11月11日：钱校长、于建国副校长、涂善东副校长、钱锋副校长现场指导准备情况；

**11月17-21日：正式认证。**

## Visited ABET (May 5, 2012)



Maryanne Weiss

Sherri Hersh

# Signed Consultation Agreement

(September 24, 2012)



Consultation Agreement  
24 September 2012

#### Services

The ABET Foundation, Inc. (Foundation) proposes to provide information to the East China University of Science and Technology (ECUST) (University) about its readiness to seek accreditation from the ABET Engineering Accreditation Commission for ECUST's undergraduate chemical engineering program. Details are provided in the remainder of this agreement.

#### Work Details

The Foundation's representative (consultant) will complete the following work:

- Initial consultation with the University to determine the necessary material (documents, other media) and the on-site activity needed to perform the review.
- A thorough review of material provided by the University prior to an on-site visit.
- An on-site visit to the University location to review additional documents, materials, facilities, and personnel as agreed prior to the visit.
- A verbal debriefing with University-designated representatives to provide initial observations and recommendations at the end of the visit.
- Additional work as mutually agreed by the consultant and the University.
- A report providing observations on the readiness of the reviewed University program for an accreditation evaluation by ABET, and recommendations for actions to further strengthen the program relative to readiness for an accreditation evaluation.
- A follow-up on-site visit or materials review if mutually agreed by the consultant and the University.

The University agrees to:

#### Offered by the ABET Foundation:

Richard O. Anderson  
Board Chair  
The ABET Foundation, Inc.

24 September 2012

Date

#### Accepted by East China University of Science and Technology:

Zhongyi  
Dean, School of Chemical Engineering,  
East China University of Science and  
Technology

27 Sept. 2012

Date

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# ABET任命顾问 Prof. Briedis

(May 27, 2012)

On May 27, 2012, at 4:13 PM, Joe Turner <turner@clemsun.edu> wrote:

- > Xuhong,  
>  
> Attached is a draft of an agreement with the ABET Foundation for consultation services. Also attached is the CV for our proposed consultant. We were pleased to be able to obtain such a highly-qualified consultant for you. Please review these and let me know whether they are acceptable.  
>  
> Please provide the following for the agreement:  
>  
> 1) The name, position, and email address for the primary contact person who will coordinate the details of the visit and related activities with the consultant. (I expect that this would be you, but it could be someone else at ECUST.)  
>  
> 2) The name, position, postal mailing address, and email address for the ECUST contact to who should receive the Foundation invoice when the visit is complete. (This also could be you, your dean, or an official in the financial management department of your college or university.)  
>  
> 3) The name and position of the person who will sign the agreement on behalf of the university. (This can be anyone who is authorized to sign such agreements on behalf of the university.)  
>  
> When I receive this information, if everything else is acceptable to you then I will send you a copy of the agreement signed by the Foundation Board Chair. You will have the official representative of ECUST to make a copy of the signature page, sign it, scan and return it to me. Once we have received your signed agreement then the consultant will contact you to proceed with the consultation.  
>  
> Please let me know if you have any questions about these procedures. We look forward to working with you to prepare your program for an accreditation review by the ABET EAC.  
>  
> Joe

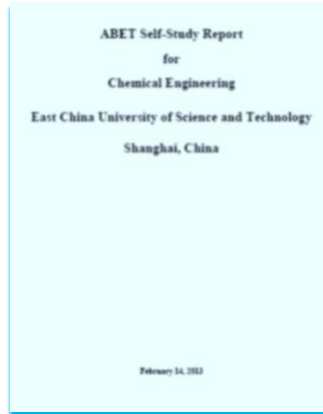


Daina Briedis教授本科毕业于威斯康星大学，在衣阿华州立大学获得化学工程博士学位，现任密执根州立大学工学院院长助理。她从1987年起就担任ABET化工领域的认证专家，曾多次担任ABET认证组长及委员会成员。

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# 交自查报告 (Self-Study Report) 初稿

(February 14, 2013)



Submitted to ABET for Readiness Review on February 14 before the deadline (February 15).

[www.abet.org](http://www.abet.org)

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## Submitted all Documents before Deadline

February 14, 2013: 正式提交认证申请

2010-2014 Request for Evaluation - East China University of Science and Technology 02142013

### Evaluation Options

Institution Name: East China University of Science and Technology  
It is requested that the following programs be evaluated by the Engineering Accreditation Commission.  
Evaluations by more than one Commission are being requested and a simultaneous visit is desired. No

Chapters may visit your institution with the evaluation team (at no expense to your institution).

State Licensing Board: Yes  
ABET-affiliated society practices: Yes

Signature: *Dian Xueping* Date: Feb. 14, 2013  
Chief Executive Officer

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# ABET顾问Briedis教授访问我校

(March 19-22, 2013)



## 安全问题:

- 无实验服、防护镜
- 无安全标识
- 可燃气体无应对措施
- 压缩机无防护
- 奉贤学生实验时打手机

# 通过ABET预审 (Readiness Review)

(April 8, 2013)



ABET  
1600 Wilson Pike, Suite 1000  
Baltimore, MD 21204  
Phone: 410-326-7200  
Fax: 410-326-7208  
www.abet.org  
info@abet.org

Accredited Science Accreditation Commission  
Computing Accreditation Commission  
Engineering Accreditation Commission  
Engineering Technology Accreditation Commission

April 8, 2013

Zhimei Xu  
Dean  
School of Chemical Engineering  
East China University of Science and Technology  
Shilong Road 130  
Shanghai 200207  
China

Dear Dean Xu,

We have conducted the readiness review of your institution's Program Preliminary Self-Study Report for the Chemical Engineering (CE) program seeking initial review by ABET's Engineering Accreditation Commission (EAC).

The ABET Readiness Review Committee recommends that your institution continue with the 2013-14 Request for Evaluation (RFE) for the Chemical Engineering (CE) program if each Criterion section in the Self-Study can be fully addressed and further refined for the final submission due July 4, 2013.

- Information regarding up-to-date and faculty required in the Self-Study Questionnaire is provided in only a limited fashion.
- Since English is not the native language in your country, please be prepared that an English translation for your institution's website, information and/or some displayed materials for on-site review may be requested by the review team.

You may choose to postpone the 2013-14 review for the program if more time is needed to prepare for the Self-Study, submission of on-site review. Please notify us of your decision to continue or withdraw the 2013-14 RFE by April 18, 2013. We will be notified for withdrawal if we are notified within the stated deadline.

As there is no way to predict with absolute certainty the review team's findings and the committee's final decision, please be advised that readiness review is not a guarantee of the final accreditation result. It may be rescinded by the appropriate commission.

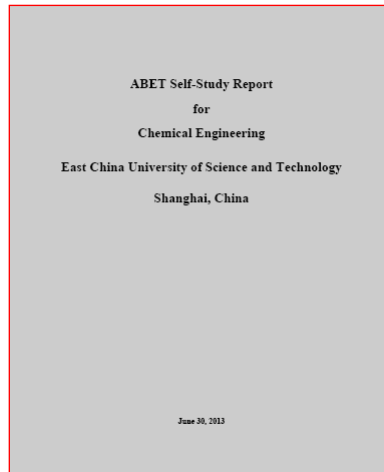
Please do not hesitate to contact me at 1 (410) 342-7730 or [info@abet.org](mailto:info@abet.org) if we can be of further assistance.

Sincerely,

Maryanne Weiss  
ABET Senior Director for Accreditation Operations



## 正式提交自查材料 (June 1, 2013)



(交正式稿,  
纸质和光盘)

## ABET专家组和认证日期确定

(June 27, 2013)

认证日期: 11月17-21日



1. Prof. David B. Beasley  
Arkansas State University  
工学院院长, 认证组长  
(也是刚刚卸任的ABET工程认证委员会主席)



2. Prof. James Edwin Smith  
Department of Chemical and Materials Engineering  
The University of Alabama in Huntsville



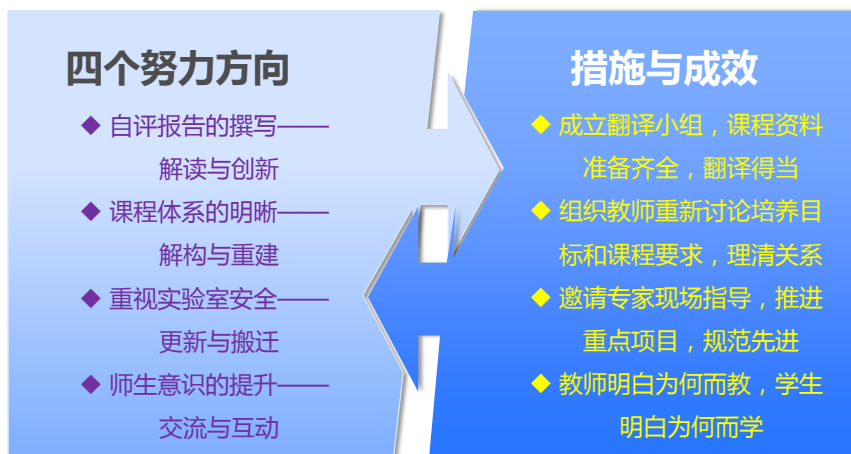
3. Dr. Andrew James Wilson  
URS Corporation (优斯国际咨询公司) – Abu Dhabi  
Principal Consultant

## 认证准备一：对照标准找差距

我们的基础	ABET的要求
<ul style="list-style-type: none"><li>• 培养目标明确，招生质量上乘</li><li>• 基础扎实深厚，课程体系完整</li><li>• 重视教学质量，控制系统严密</li><li>• 重视实践教学，基地设施完善</li><li>• 产学研紧密结合，面向社会</li><li>• 毕业生质量优秀，就业率高</li></ul>	<ul style="list-style-type: none"><li>• ABET特别强调“以人为本”</li><li>• ABET特别强调“安全规范”</li><li>• ABET特别重视“持续改进”</li><li>• 要求课程建设“目标明确”</li><li>• 期望师生间拥有良好互动</li><li>• 对毕业生提出11项具体要求</li></ul>

结论：存在差距，但有些是表述差异，有些是不够系统化和标准化，通过努力完全可以达到。

## 认证准备二：确定具体措施



在一年多的时间里不断充实、改进、超越！

## 材料准备

### 系统准备了课程展示材料

- 12门专业核心课程所使用的教材

- 12门课程共14个文件夹材料

教学大纲、教材封面和目录；课程  
试卷；课程试卷分析表；作业本；  
双语班作业；课程教案、学生报告、  
讲座资料等



- 每门课程附加1个16G的卡片式U盘扩展材料
- 课程设计、项目设计、毕业论文汇总材料
- 相关教学管理文件

## 重新表达专业培养目标

华东理工大学化学工程专业本科项目的教育目标是为了给我们的学生提供一个以化学工程为基础的教育，使他们在整个职业生涯中成为有创造性的合格专业人员。

华东理工大学化工系致力于培养能够利用技术和专业知识来做到以下内容的毕业生：

- 在工业操作、学术或研究等不同领域出色工作；
- 在他们的职业生涯中了解面临的大部分问题；
- 通过他们职业成就提升华东理工大学的声誉。

The educational objective of the ECUST chemical engineering program is to provide our students an education that lays the foundation of chemical engineering for them to be productive and fulfilled professionals throughout their careers.

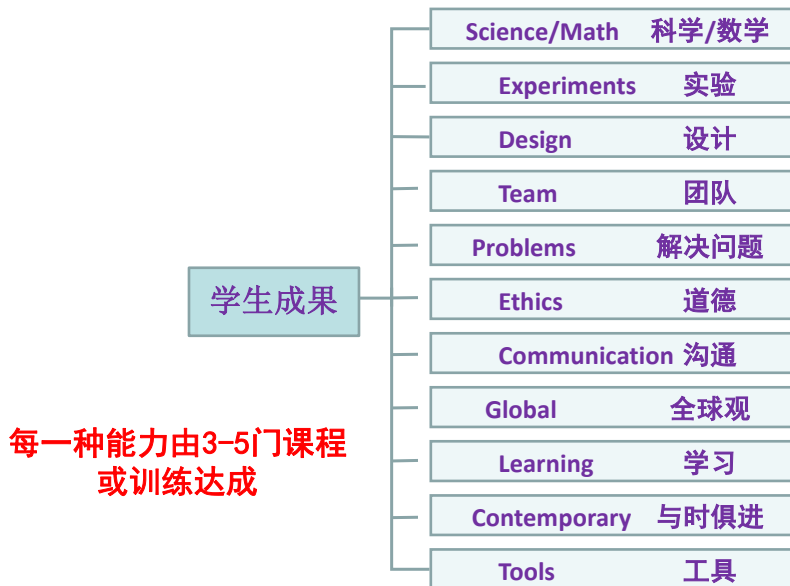
The ChE department of ECUST strives to produce graduates who will use their technical and professional education to

- Work successfully in diverse careers i.e. industrial practices, academia, and research.
- Understand the larger context of the problems faced during their career.
- Through their professional accomplishments, enhance the reputation of ECUST.

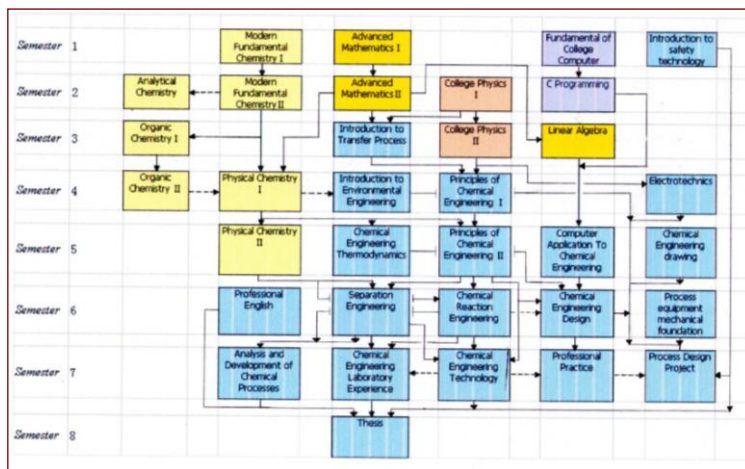
## 培养目标和学生成果的关系

Program Educational Objective	Student Outcomes										
	Technical Skills					Professional Skills					
Graduates who will use their technical and professional education to	Science/Math	Experiments	Design	Team	Problems	Ethics	Communication	Global	Learning	Contemporary	Tools
1. Work successfully in diverse careers i.e. industrial practice, academia and research.	√	√	√	√	√	√	√	√			√
2. Understand the larger context of the problems faced during their career.	√	√	√	√	√	√		√	√	√	√
3. Through their professional accomplishments, enhance the reputation of ECUST		√	√	√	√	√	√	√	√	√	√

## 确定课程与ABET11项能力的对应



## 理顺课程间的关联



## 课程平台要满足ABET要求

Curriculum Subject Area	Math& Basic Sciences	Engineering Topics	General Education (English etc.)	Other (computer, Electro-technics etc.)	Total Credits
Required	46	65.5	28	10.5	150
Elective	0	13.5	8	0	21.5
<b>Total Credits (ECUST)</b>	<b>46</b>	<b>79</b>	<b>36</b>	<b>10.5</b>	<b>171.5</b>
Minimum credits (ABET)	32	48			
Percentage (ECUST)	26.8%	46.1%	21%	6.1%	100%
<b>Minimum Percentage (ABET)</b>	<b>25%</b>	<b>37.5%</b>			

## 量化专业课对学生成果的权重评价

### 12门专业课程学生成果目标值

课程 学生 成果	(1) 安全技术 导论	(2) 传递过程 概论	(3) 环境工程 概论	(4) 化工原理 /实验		(5) 化工 热力学	(6) 计算 机化工	(7) 化学 反应 工程	(8) 化工 设计	(9) 分离 工程	(10) 化工 工艺	(11) 化工过 程开发	(12) 化工专 业实验
(a)		5		5	5	5	5	5	4.5	5	3.5	3	4
(b)		5		5	5	5	3	4				5	5
(c)			2	5	3			3.5	5	4	4	3	
(d)	3				3				5				
(e)		5		5	5		3	4.5	5	5	4.5	5	3
(f)	5		4	5	4				3.5		2		4
(g)					5				4.5		3	1	5
(h)	4		5	5	4				4	2	3	1	3
(i)	4			5	4		4		4		2		
(j)	4		4	5	4				3.5	2	3		
(k)				5	5	5	3	4.5	4.5	3	3		4

## 实验室安全改造

### 我们的误解：

- 以为大而全、卫生整洁即可；
- 以为只看专业实验室；
- 以为有实物即可；
- 以为获奖、评优就代表水平高。

## 请外企安全专家指导设计安全方案

- (1) 化工实验装置在加料、取样、尾气排放口设置局部排风口；
- (2) 可能出现化学试剂泄漏处使用二次容器；
- (3) 高温部件外表增加防护罩，以防烫伤；
- (4) 玻璃易碎部件增加防护网罩，以防碎裂塌陷；
- (5) 安全标识全覆盖；
- (6) 合理安装洗眼器、淋洗装置；



索尔维公司安全经理：[成银梅](#)  
陶氏化学环境与安全经理：[张燕](#)



## 硬件准备

### 专业实验室安全改造和搬迁



● 改造前的专业实验室

● 改造后的专业实验室

## 化工专业实验装置《乙苯脱氢》



改造前



改造后

1. 进料、取样、出料口增加局部排风；
2. 仪器外表温度超过60℃，增加防护罩；
3. 安装飞温保护控制，自动断电；
4. 安装漏电保护措施；
5. 安装危险气体监测报警器；
6. 装置及实验室内张贴警示标识。

## 化工原理精馏实验装置



改造前



改造后

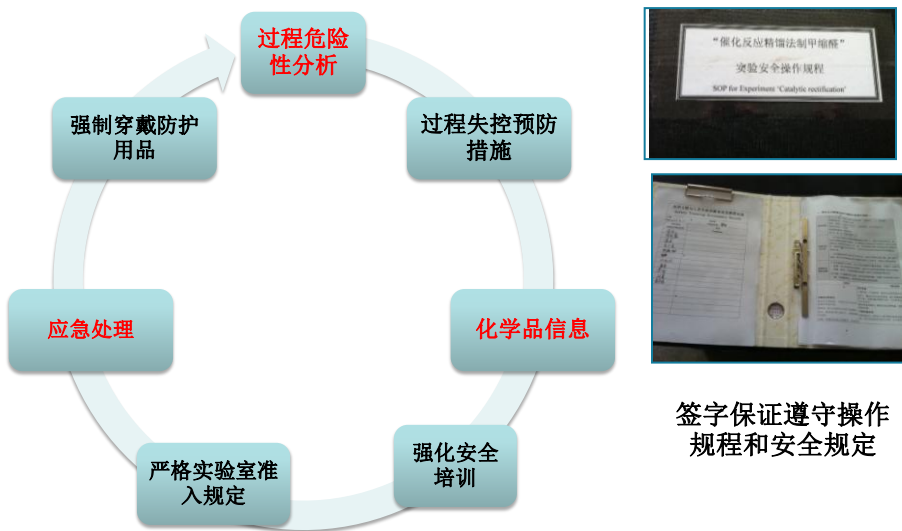
1. 采用防爆灯具、开关；
2. 增设排气罩、危险气体监测报警；
3. 仪表线暗敷，电接点不外露；
4. 外包保温材料，隔热、防烫；
5. 底部定做不锈钢托盘作二次容器；
6. 张贴安全标识。



## 强化化工实验室安全设施

- 1、强制要求进实验室必须**穿实验服、戴防护镜**，**集中保管手机**；
- 2、实验室留出紧急疏散通道；
- 3、安装烟雾警报和自动喷淋，充实消防器材；
- 4、改造通风系统，设置危险气体警报器等监控措施；
- 5、规范布线，杜绝乱拉电线；
- 6、气体钢瓶安装安全泄压阀，管线排布整齐，警示标识明确。

## 强化安全意识和安全培训



## 创建安全文化氛围

### 实验室环境：

整洁有序、制度健全、管理规范；

### 安全文化氛围：

标识明确、人性化的警示、物质安全资料 (MSDS) 齐备



## 实验室安全改造的体会

### ABET对安全的要求：

- 实验室**安全一票否决**；
- 关注学校和老师的**安全责任感**；
- 关注学生的**安全意识**培养；

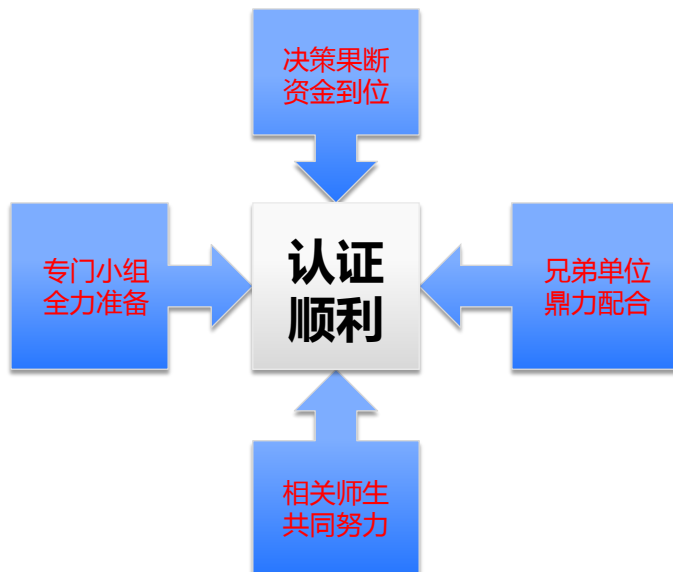
### 我们的体会：

- 高度重视，仔细排查隐患；
- 注意软件：安全资料、预案、意识；
- ABET认证**是达标，不是评优排名**。

## 几点重要启示

- 建立培养目标和培养方案**持续改进**机制；
- 完善专业课程**量化评价**体系；
- 重视实验室**安全意识**的潜移默化。
- **以学生为本**，建立全过程多层次的持续关怀机制。

## 我们的经验和体会



THANK YOU!

